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PRIMA ARBORUM.



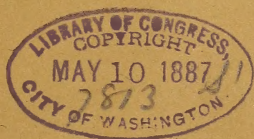
*By Sam
Rae.*

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WITH

ILLUSTRATIONS.

SAMUEL RAE & CO.



*New York
The
Vine
Press 1887*



OLIVE GROVES, MONTEMAGNO. (PISA HILLS.)



PRIMA ARBORUM

SOME ACCOUNT OF THE OLIVE-TREE AND ITS FRUIT.

Olea prima omnium arborum est.—COLUMELLA.

SAMUEL RAE & CO.

HISTORICAL NOTES.

THE olive is supposed to have been introduced into Italy about the year 550 B. C. The ancients had a special veneration for this useful tree, which, according to mythology, sprang from the earth at the command of Minerva and was held sacred to this deity. L. Junius Moderatus Columella, who wrote on agriculture in the early years of the Christian era, calls it “the chief of all trees.”

Linnæus named the olive *olea europæa* and considered it to have been indigenous to Europe and Africa; while other writers attribute its origin to Asia, whence it is supposed to have been brought to Attica, about 1556 B. C., by Cecrops, who also taught his subjects to cultivate it. Pliny says that the olive was not known in Italy, Spain, or Africa in the time of the first Tarquin.

At first its cultivation would appear to have spread slowly in Italy, for under the consulate of Appius Claudius and Lucius Junius, about 248 B. C., olive oil must have been an article of luxury in Rome, selling as it did at twelve *asses* the *libra*; but one hundred and eighty years later it had fallen to a tenth of its former value, a sign that the production must then have been large; while under the fourth consulate of Pompey, Rome exported olive oil to her subject provinces.

The Etruscans, during their independence, do not appear to have cultivated the olive, for they are said to have imported olive oil from Greece.

Lucca and Populonia, the latter an extinct Etruscan city which was situated near the present town of Piombino, are mentioned as the localities in Tuscany where the olive was first planted. Liguria is said to have been the last region

in Italy to cultivate the olive; Strabo describes it as a wild and mountainous country dependent upon lower Italy for supplies of wine and olive oil.

SOME FIGURES.

In Italy the extent of land devoted to the culture of the olive is stated to be about two and a quarter million acres. A full crop of oil is estimated at about eighty-nine and a half million gallons, thus apportioned:

Liguria or Riviera, extending along the coast line from the French frontier to Massa Carrara	9,100,000
Lombardy, Venetia, Emilia and the Marches.	2,200,000
Tuscany	7,500,000
Umbria and Latium	6,300,000
Bari	7,800,000
Neapolitan provinces on the Adriatic, exclusive of Bari	14,900,000
Neapolitan provinces on the Mediterranean	16,800,000
Sicily	19,300,000
Sardinia	5,600,000
Gallons	89,500,000

Thus it will be seen that the greatest production of olive oil is obtained in the Neapolitan provinces and Sicily, though at the same time these regions, with the exception of Bari, produce oil of low quality.

In practice, however, a full crop of oil is rarely approached, nor, considering the many and exceptional vicissitudes to which the olive crop is exposed, is this much to be wondered at.

The following are the official returns of the production of olive oil throughout the Kingdom during the last seven years.

ACTUAL OLIVE OIL PRODUCTION OF THE KINGDOM OF ITALY.

Year.	Gallons.
1880	86,000,000
1881	34,600,000
1882	56,800,000
1883	41,300,000
1884	46,800,000
1885	47,000,000
1886	64,300,000

An average of about fifty-four million gallons.

Spain, as an olive oil producing country, comes next in importance to Italy, though a long way behind; while France in this respect is at a great disadvantage compared to both, her production of olive oil being a fraction of what Italy produces, and quite insufficient for her own consumption. Hence France is obliged to draw large supplies of this article from other countries and chiefly from Italy, her total imports for the last five years having averaged over seven million gallons.

Next to France, Great Britain is Italy's best customer for olive oil. Exports to the United States are relatively small and chiefly of the better qualities of oil. This trade, however, is certain to develop, as the universal tendency is to import commodities direct from the country of their production.

The total exports of olive oil from Italy for the last ten years have averaged about twenty million gallons. Hence the consumption in Italy must greatly exceed these figures.

THE TREE.

The olive is an evergreen tree of slow growth, its wood is hard and compact, the leaves lanceolate, silvery and downy



OLIVE-TREE BY GATEWAY OF LA CERTOSA, (CALCI.)

underneath; whence, viewed from a distance and especially when the leaves are moving in the wind, an olive plantation acquires a grayish tone. The fruit as it begins to ripen assumes a ruddy hue and when quite ripe is of a dark plum color, almost black, and glossy. The ripe pulp is of a creamy color.

In Italy the blossoming takes place between April and June; but generally it has been found that a late blossoming means a poor crop; for though the show of flowers may be fine, they do not bind. The flowers are very small, of a pale yellow, and grow in clusters of ten or fifteen; but of this number not more than a third or a fourth come to maturity.

CLIMATIC CONDITIONS.

The olive-tree needs a warm but temperate climate: excessive heat and excessive cold are both injurious. In the tropics it has been observed that although the tree vegetates, it bears no fruit, and in North Africa olives are to be found only near the shores of the Mediterranean, where the heat is tempered by sea-breezes.

Excessive cold will kill the tree; the lowest temperature which the olive can bear is 14° Fahrenheit. At 12° not only the foliage, but the trunk and surface roots perish. But when rain is followed immediately by frost, and particularly while the sap is rising in the trees, even at 20° Fahrenheit, great damage may be done. The same result occurs after a fall of snow when bright sunshine causes a partial thaw, followed by frost after sunset; the effect of extreme cold on the olive-tree varying according to the dryness or dampness

of the atmosphere at the time, and the season of the year; so that extreme cold is more fatal to the tree in the spring than in winter.

In localities where the temperature in summer is very high, it is customary in planting olives to select a northerly exposure; but in Tuscany and generally in central Italy, the reverse is the case, and warm, sheltered localities are chosen.

The olive in hilly country gives better results than in the plain, where it is not possible to obtain the finest qualities of oil. Too rich or too moist a soil is unfavorable; a sheltered hill-side best suits it and a medium soil. The olive likes a subsoil of rock; its roots seek out any clefts and fissures and intertwine themselves around any loose fragments of rock, thus affording security to the tree during the prevalence of high winds.

In central Italy the olive is not to be found at a greater elevation than about fifteen hundred feet, and at this altitude its productiveness is very uncertain.

CULTIVATION.

In some parts of Italy the olive-tree is planted in rows far apart, and the intervening space devoted to vines and grain, or other crops; but much the better plan is to plant olives by themselves, as generally practiced in the best olive districts of Tuscany, where the culture of this tree has attained the greatest degree of perfection. The olive is pruned at intervals of two years, during the months of February and March, and manured generally every three years.

It may be propagated by seed, cuttings, shoots, or *ovoli*. Seedlings are

hardy and acclimatized to the locality where they are raised, but of slow growth. Hesiod says that he who sows the olive will not eat of the fruit of it. Plants obtained in this way invariably revert to the wild variety, as indicated by their very narrow and pointed leaves, and therefore require grafting.

Though the wood of the olive is very hard, yet cuttings properly planted will throw out suckers very readily; a circumstance to which Virgil calls attention in the lines:

“Quin et caudicibus sectis, mirabile dictu
Truditur e sicco radix oleagina ligno.” *

The cuttings should be two or three feet long, a couple of inches in thickness, and straight.

Neither this method of propagation, nor that by shoots taken from the parent tree, are much resorted to, *ovoli* being generally preferred by olive-growers as an easier, simpler, and generally more satisfactory method. The term *ovolo*, from *ovo*, an egg, is given to those egg-shaped excrescences which appear on the trunk of the olive-tree near its base and on its large exposed roots. The *ovoli* are carefully excised from the tree and bedded; when shoots appear, the strongest is selected, the others being removed. At from four to seven years old the young trees may be planted out.

VITALITY.

Under favorable circumstances the olive attains to a great longevity and may continue to bear fruit for centuries. Pliny mentions that in his time there were to be seen at Liternum, a town in

the Roman Campania, olive-trees which Scipio Africanus had planted 250 years before. In the island of Pianosa, off the coast of Tuscany, are to be seen some thousands of trees, of the semi-wild type, still thriving, which are said to have been planted there seven centuries ago or more. The olive near the gate-way of the Certosa monastery at Calci, shown in one of our illustrations, is many centuries old, and continues in its prime, not showing any signs of decay. In the olive wood on the hill-side close by, formerly the property of the monastery, there are many trees, from three to four centuries old, which are still in full bearing. Some of the Saracenic olive-trees of Sicily are of very great age and extraordinary size; the trunk of one was found to measure twenty-six feet in girth, according to Prof. Aloï, who also states that some of these trees are known to have produced nearly twenty-eight bushels of olives each at a crop.

But in the aggregate the life of the olive-tree is estimated at from 100 to 150 years.

ITS ENEMIES.

Frosts, as we have seen, are very destructive; many trees are blown down, a circumstance arising from the fact that olives are often to be found in hilly localities. The tree is subject to attacks from a variety of insect pests, some of which injure the leaves, others the fruit, branches, or trunk. Amongst the worst of these may be mentioned the *cossus ligniperda*, which, however, does not confine its ravages to the olive-tree. In its grub state the *cossus* is provided with powerful mandibles and eats its way into the heart of a tree, causing its ultimate destruction.

* And moreover, wonderful to say, if the stems are cut into lengths an olive-root is thrust forth from the dry wood.—Georgic, L. II. 30.

Then much damage is caused by a species of canker to which the name *lupa*, or she-wolf, is given. An olive-tree to outward appearance quite sound may be internally rotting away. The remedy for this disease is to cut away carefully all the part affected; hence trees are often to be seen whose trunks are reduced to mere skeletons, as shown in another of our illustrations. Yet in this condition the olive may hold on for years.

Several insects attack the fruit of the olive, but the worst of these is the olive-fly, *musca dacus oleæ*. The ravages caused by it in Italy are incredible, and may amount to some millions of dollars in a season; hence it is the bugbear of the olive grower. This insect is about half the size of the common house-fly, the head is orange-colored, eyes green, back grayish, the wings are transparent, and in the sunshine iridescent. When the young olives are fully formed, the female commences its operations puncturing the fruit and then laying an egg therein. It is estimated that a single fly may thus deposit three to four hundred eggs. The egg develops into a small, white maggot, which eats its way within the olive and around the stone until it thus destroys the greater part of the pulp. Passing next into the chrysalis stage, in the course of a few days it develops into a fly.

The olive-fly usually makes its appearance in July, and as only about four weeks elapse between the laying of an egg and the development of a new fly,

there is ample time for a succession of these destructive operations before the approach of cold weather reduces it to inactivity. Enormous injury has thus been caused to many a splendid crop of olives. The damaged fruit yields little oil and of very bad quality—rank, thick, and nauseous. As yet no means of coping with this insect have been found. It has been suggested that the destruction of small birds in Italy, and particularly in Tuscany, which feed upon such insects, may partially account for the great prevalence of the *musca oleæ*.

In the Nice district its ravages are no less redoubtable. “L’olivier produisait autrefois des olives, il ne produit plus maintenant que des *keirons*; le *keiron* est un méchant ver qui, à force de manger l’olive finit par la remplacer. Monsieur Cauvin a eu beau rédiger une brochure contre l’insecte, l’insecte ne continue pas moins à ruiner les propriétaires, en attendant que les propriétaires se décident à ruiner et les oliviers et les *keirons*.” *

In a severe season considerable damage may also be done to the fruit by a hard frost, particularly if preceded by snow or rain. The damaged fruit gives a diminished yield of oil, and this acquires a darkish color and an unpleasant taste.

VARIETIES OF THE OLIVE-TREE.

There are in Italy many varieties of the olive, but the precise number has not been ascertained, the same kind often going by another name in differ-

* Emile Négrin, “Guide de Nice.” “The olive-tree once used to produce olives, now it produces only *keirons*; the *keiron* is a mischievous maggot, which by dint of eating up the olive berry ends by taking its place. Mon-

sieur Cauvin might have saved himself the trouble of writing a treatise against this insect, for none the less does the insect ruin the land-owners, pending a decision on the part of the land-owners to destroy both olive-trees and *keirons*.”



OLIVE-TREES INJURED BY LUPA.

ent localities. In Tuscany alone some twenty varieties were at one time known, but of late years growers, in planting and grafting, have confined their choice to a few of the better descriptions of trees. In selecting these, due regard must be had to the special conditions of the locality where new trees are to be planted or existing ones grafted. Those kinds which most approximate to the wild olive are much the hardier and will thrive where the choicer, but more delicate, sorts could not live.

The various kinds of olive-trees may be thus classified :

First. Trees but little removed from the wild olive, of stunted growth and scanty foliage, leaves small; fruit small and deficient in pulp, yielding little oil, which moreover is rough and somewhat bitter to the taste, hence considered at the best a second-rate quality. This class of tree is hardy and the fruit is less liable to be attacked by insects than the more pulpy kinds, but beyond this it has nothing to recommend it. The *Moraiolo* olive, which is to be found in certain parts of Italy and is largely cultivated in Provence, France, owing to climatic conditions, is a type of this class.

Second. Trees of much greater size than those just described, with dense, dark-colored foliage, leaves large, fruit big, with abundant pulp (much used for pickling, for which purpose it is picked green, first placed in a lye and afterward in brine), but the oil it yields is coarse and heavy. This class is very sensitive to frost, liable to many diseases, and requires a rich soil. It is largely to be found in the south of Italy; the *Spagnuolo* or Spanish olive is a type of it.

Third. The third may be described as an intermediate class, possessing to a considerable degree the good qualities of both the foregoing classes without any of their bad properties. The trees of this class thrive in hilly districts with a medium soil and temperate climate. They attain a considerable size and are well covered with dark-colored foliage. The fruit is well developed and yields the finest oil. The *Razzo* olive, which is *par excellence* the type of this, the best, class of olive-tree, prevails almost to the exclusion of other varieties in the districts of Lucca and Pisa, in Tuscany, famed for their oils. It is also to be found to some extent, along with similar but still inferior varieties, in the districts of Bari, Riviera, and Nice.

THE HARVEST.

In the south of Italy the olive harvest begins about October; in Tuscany, fully a month later; but it is never in full swing until near the latter part of December. According to the extent of the crop it may not be finished until March or even later. Sometimes the last of the olives are not picked until so late as May or June.

In some localities the practice is to strip the trees of their fruit, either by knocking it off with staves—which is injurious to the tree, as along with the fruit leaves and twigs are torn off—or by the more rational method of picking the fruit by hand, when the boughs which are not accessible from the ground are reached by men and boys with ladders. Where this system is followed, the harvest may be completed within January or February, or sooner with a short crop.

Elsewhere the olives are gathered as they fall to the ground from ripeness, or are blown down. After a high wind the turf beneath the olive-trees is often strewn deep with olives. Where fine oil is made, the olives are quickly gathered up by women and taken at once to the olive mill, and a selection is made of the sound and unsound fruit. Should the fruit remain any time on the ground, it deteriorates greatly, producing defective oil.

YIELD OF OIL.

The yield of oil obtained from a given weight of olives ranges between fourteen and twenty per cent., according to the ripeness and variety of the fruit; eighteen to twenty per cent. is obtained from fine olives of the best sort.

Taking an olive plantation in Tuscany, where the trees are well grown and in full bearing, it is estimated that, in a good season, the return of oil should average from one to one and one-half gallons per tree. As a rule, a tree which has a good show of fruit will in the ensuing season carry little or none.

RIPE AND UNRIPE FRUIT.

The oil obtained from unripe fruit is of a greenish shade and has a rough, peppery taste. Over-ripe olives yield a very pale oil, deficient in flavor, and, if not already rancid, liable to become so very soon. It stands to reason that the best oil should be that obtained from olives which have just attained the proper degree of ripeness. Such oil is of a fine golden color and possesses a delicate taste of the fruit.

FINE AND COMMON OIL.

There are of course in olive oil, as in any other product of the soil, many degrees of fineness; but, broadly stated, the difference between *fine* and *common* olive oil, as these terms are understood in Tuscany, is due to the condition of the fruit when pressed and to the diligence used in the process of oil-making.

To obtain *fine* oil, the fruit must be sound, freshly gathered, and promptly crushed and pressed before any fermentation can ensue. Moreover, a supply of pure water is indispensable, and the mills, presses, and various utensils required must be absolutely sweet and clean, while a constant attention to details is essential.

Common oil is the result of the absence of one or all of these conditions. In those districts of south Italy and Sicily where common olive oil is largely produced, hardly fit for anything but manufacturing purposes, even should the olives be sound when they leave the tree, they often lie on the ground for a considerable time from want of hands to gather them. More often still, the fruit is kept for some weeks before being crushed, in the mistaken belief that the fermentation which ensues causes an increased yield of oil.

Cato, writing more than a century before Christ, in his treatise "*De re rustica*," combats this very notion. "It is not to be believed," he says, "that oil increases (by keeping the olives) in the store-house; but rather that it diminishes and becomes of the worst quality." Columella pronounced it "as unfounded as that wheat could increase in the granary." Notwithstanding, this fallacy is still entertained in some sections of southern

Italy and Sicily, as well as in other olive-growing countries.

The result is a fetid oil, of low commercial value. With the increasing competition of cheap seed oils, olive growers will probably find themselves compelled to abandon such bad practice and to endeavor to produce a better article. It must be added, however, that in the localities where these common oils are produced they are actually used for food, and even preferred, by certain classes, to fine oil, their very rankness seemingly imparting additional zest. Thus an Italian writer says: "If you give to a peasant in Puglia or Calabria a plate of cooked vegetables dressed with Tuscan oil, he will not relish it, but will pronounce it insipid, without smell or flavor. Such is their taste. Common oil, which our palates would pronounce to be uneatable, has its admirers."

There are many grades of common olive oil; all are bad, but some much worse than others. The olive oil produced in Morocco, Algeria, Tripoli, Tunis, Syria, Asia-Minor, Greece, Spain, and Portugal is all of it, more or less, *common*, but yet it is largely used in these countries for food.

OLIVE OIL MAKING IN TUSCANY.

In Tuscany, where the aim is to produce olive oil as fine as possible, the greatest attention is given to the process of making it. Factories, meaning by this term something analogous to the cheese factories of America, are unknown, nor would they be at all desirable. Olives will not bear transportation to any considerable distance. The less they are handled, the better for the quality of the oil: the bruising and heating of the fruit, incidental to trans-

porting it any distance, would ruin the quality of the product. The large olive growers have their own mills; the smaller growers take their olives to some neighbor's mill, there to be pressed in their presence; the oil as it is produced is taken away and the refuse of the olives is left to the mill-owner in payment of his dues.

The *modus operandi* is as follows: The olives, as soon as gathered, are brought to the *frantoio*,—so the mill is called. Storage is generally provided in an upper floor, where the olives are spread out until they can be crushed; but they are never allowed to remain longer than twenty-four hours, because olives, particularly if wet when brought in, rapidly get mildewed, and the oil made from them would be bad.

The mill-trough (*pila*) is built of cut stone cemented externally; it is essential that the stone used for this purpose, as also the millstone, should be non-absorbent, lest becoming saturated with oil, which would become rancid in time, a bad taste and smell should be communicated to the product. A silicious conglomerate rock is much employed for these uses. Olive mills are most frequently worked by water power; where this is not available, by animals, generally oxen.

About ten bushels of olives are crushed at a time, the operation lasting about an hour. Pulp and stones are crushed together; the pasty substance resulting is next placed in flattish, circular receptacles, termed *bruscole*, made from a kind of rush, and tied at the mouth with a horse-hair cord. When full, ten or twelve of these *bruscole* are put in the oil-press, the number which it can hold being termed the *castello*.

Cold water is poured upon the *brus-*



GATHERING OLIVES.

cole to facilitate the flow of oil; hot water would be much more efficacious and increase the yield, but then the quality of the oil would suffer. The oil and water which serves to collect it pass into the *tinello*, a receiving vessel which stands close by the oil-press; from time to time the oil is skimmed off with a shallow pan and transferred to the *chiaritoio*, therein to settle, before it can be considered salable, or fit to be put into the *coppajo*, the oil-store, so named from the large terra cotta jars (*coppi*) in which olive oil is generally kept in the country districts.

This first pressing of the olives alone yields the finest oil—virgin oil it is sometimes called. Too much stress cannot be laid upon having a constant supply of pure, fresh water; without it the product is sure to be tainted; and the prevalence of olive oils with this defect is in great part attributable to this cause. It is equally essential that the mills, presses, and other utensils should be kept thoroughly clean and sweet; any neglect of this rule will render the product defective.

TREATMENT OF RESIDUE.

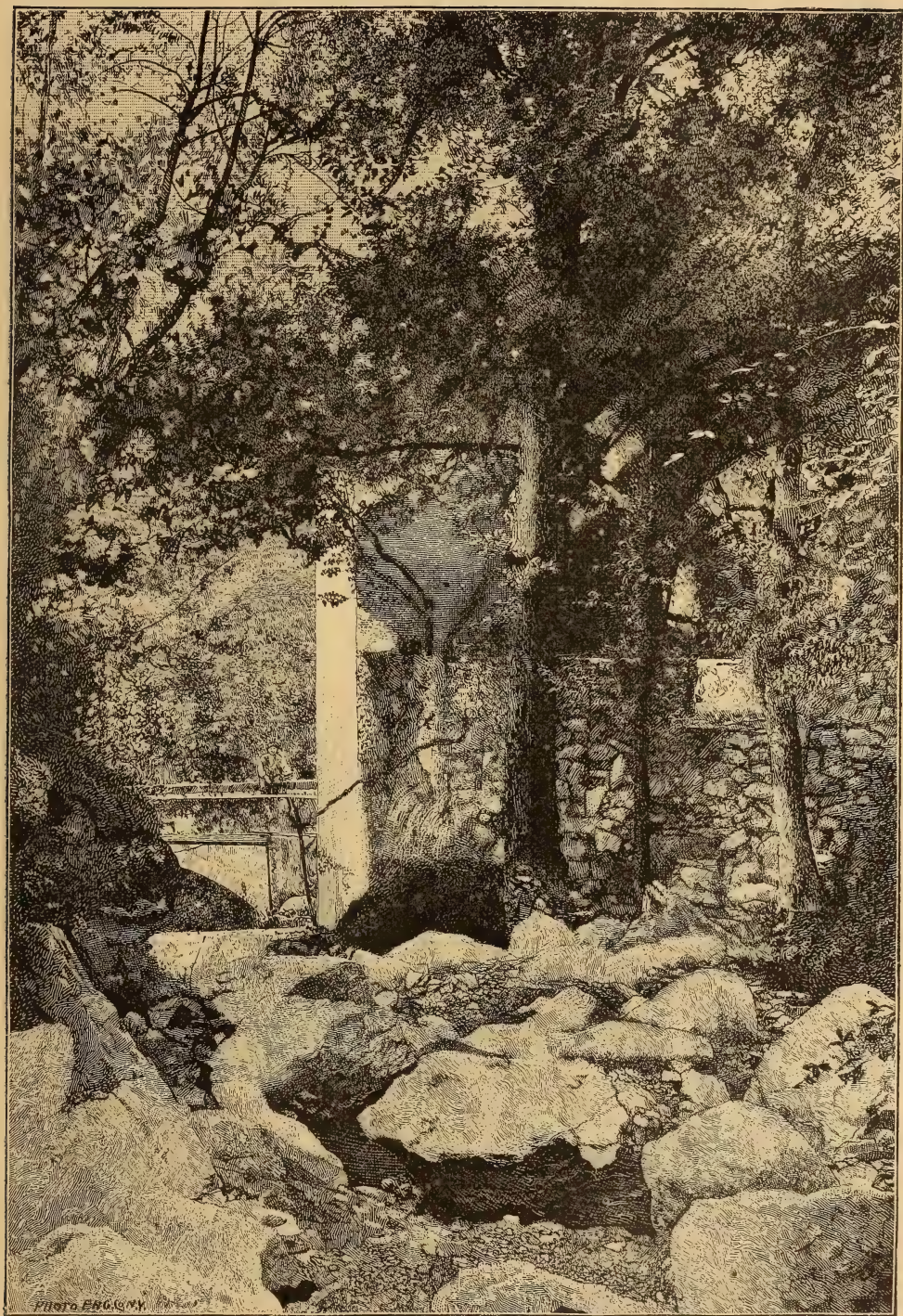
The water which has been the medium for collecting the oil as it issued from the oil-press necessarily contains a trifling quantity of oil, which, however, in the course of the season, amounts to something considerable. It is therefore conducted to a large tank, placed at some distance from the *frantoio*, to which the suggestive name of *inferno* is given, doubtless because it is the receptacle of the dregs. A film of oil gradually forms on the surface, which is skimmed off from time to time; but the stagnant water gives this oil a bad smell, and *olio*

d' inferno, as it is called, is fit only for industrial purposes.

The *inferno* is always located away from the mill, lest any smell from it should communicate itself to the fine oil, which is very susceptible of being tainted by anything of the kind. Care must be taken lest any utensil which has served for *olio d' inferno* should inadvertently be made use of in handling fine oil; for the latter would become tainted, a few drops of the refuse oil in question being enough to ruin a large quantity of fine oil.

A small quantity of oil of an inferior kind is obtained by a *second* pressing. The olive paste is again ground in the mill with the addition of some hot water, and pressed as before. If this be done immediately after the first pressing and before the paste can ferment, the oil may be fairly good, though deficient in "body." But if delayed at all, then the oil becomes absolutely bad.

Even after these two pressings the *sansa*, as the residue after being pressed is called, contains some oil. This can be extracted in two ways, but in both the oil obtained is fit only for manufacturing purposes. It may be treated in the *frullino* mill; first well ground with the addition of hot water, thence passed into an agitator, where the residue is heated up with water until the broken olive stones, washed quite clean, fall to the bottom, while the refuse of the pulp floats on the surface; then by two separate conduits the stones are discharged in one direction, the water and matters held in suspension flowing into a series of settling tanks, where any free oil comes to the surface and is collected, while the residue of the pulp is again pressed and yields a little oil. *Olio la-*



FRANTOIO. (EXTERIOR.)

vato, or washed oil, is the name given to this product.

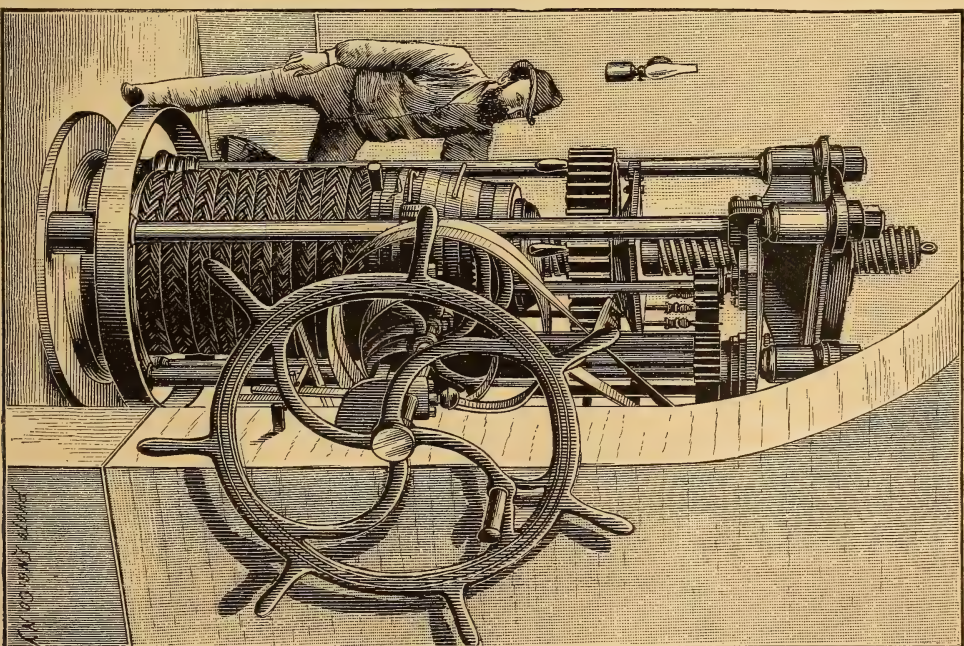
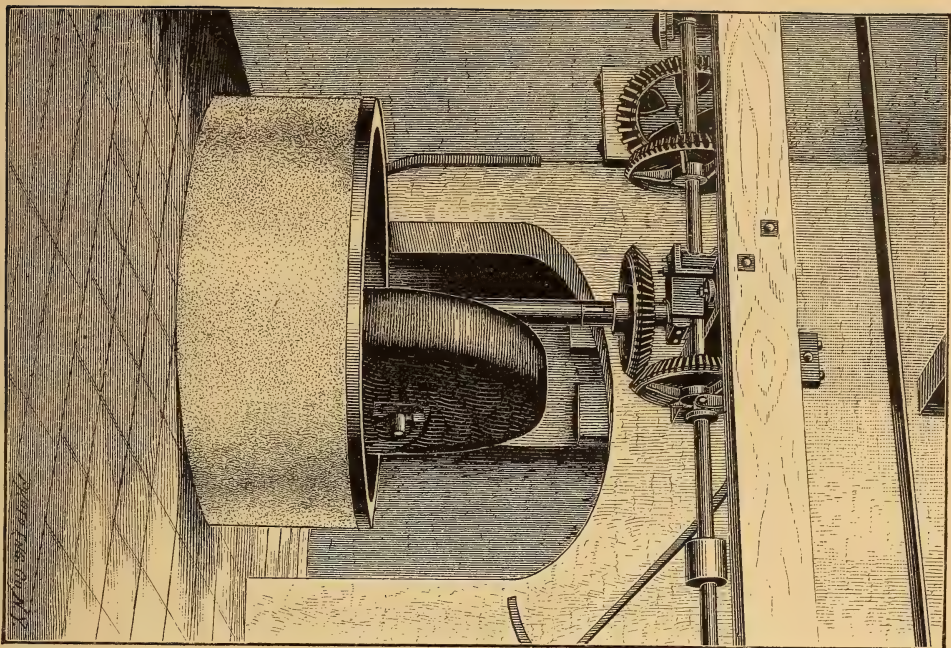
Or the *sansa* may be treated by the sulphide of carbon process, which is carried on at special factories. This chemical, in a fluid state, has a great affinity for oil, and on mixing up a certain proportion of it with the olive residue, any oil present unites itself to the sulphide of carbon. The compound is then transferred to a covered tank and heated up to about 115° Fahr., when the sulphide evaporates and is collected in a refrigerating vessel for further use, while the oil remains behind. This oil is nearly black and has the characteristic smell of the chemical employed; it is of less value for industrial uses than the oil obtained by the *frullino* process. But this system has the advantage over the latter of extracting every particle of oil, the yield of oil from the *sansa* by the sulphide process averaging ten per cent., by weight, of the material treated; while in the other way it is only about half as much.

OLIVE STONES.

As for the *débris* of the olive stones, it makes a good fuel; and this was supposed to be all it was fit for. But recently a novel use for it has been discovered by some smart and not too scrupulous traders, namely, as an adulterant for ground pepper. Many tons of this material pulverized have been exported from Italy, to England chiefly, and undoubtedly for this very purpose. The following extract from the *London Times*, for February 18, 1887, refers to this illegitimate trade:

PEPPERETTE. — Numerous prosecutions, our Liverpool correspondent writes, have recently taken place in various towns in Lancashire for the sale of adulterated pepper, and the magis-

trates have inflicted fines varying in amount from 20s. to 5*l.* and costs. The cases themselves were of an ordinary character, and in most instances it was proved that the retailer had received the pepper as genuine from the wholesale grocer or the manufacturer, and that he had sold it just as it came into his possession. That it was adulterated to the extent of twelve or twenty per cent., however, was proved beyond dispute, and hence the convictions by the magistrates. The investigation of these cases — in all there have been about 270 of them — has brought to light a curious revelation in connection with the pepper trade. Some months ago the spice grinders throughout England received a letter from a firm in Leghorn offering to supply them, at a low price, with an article which was described as *poivre*tte, or pepperette, for admixture with pepper. It was obviously an adulterant, and, possessing none of the qualities of genuine pepper, could only be used for increasing the bulk and weight of the condiment, and so augmenting the profits of those who resorted to its use. A large quantity of this *poivre*tte appears to have been imported into London. The extent to which the adulteration was carried is illustrated by the fact that almost all samples of pepper submitted to recent examination disclosed the presence of this foreign ingredient. But for a long time the true character of *poivre*tte remained a mystery. Under the microscope it had a close resemblance to pepper in color, appearance, and cells. It was hard and tasteless and was certainly not pepper, but beyond the fact that it was a dense ligneous substance, it baffled the skill of the analysts. The mystery was at last cleared up by Dr. Campbell Brown, public analyst for Lancashire, by a curious inspiration, as he has himself explained. Numerous samples of pepper adulterated by this ligneous substance were under examination, and reflecting that olives were a home product of Leghorn, he thought the stones might be the adulterant. He had some olive stones ground, and the whole problem was solved. *Poivre*tte was simply and solely ground olive stones, and the hint once being given, all other analysts have confirmed the fact. It is needless to say that olive stones in Italy are useless refuse, and that they might readily be ground and sent to England at a low price. This was the trade that had sprung up at Leghorn, and which English spice grinders were utilizing for their own advantage. In his certificate produced during the recent prosecutions Dr. Campbell



FRANTOLIO (INTERIOR), WITH OLIVE MILL AND PRESS.

Brown describes pepperette as "a hard, tasteless, woody substance, absolutely worthless, composed of ground olive stones, imported into this country from Italy and sold at 1*d.* per pound, for the express purpose of being used for fraudulently increasing the weight of pepper." When it is borne in mind that pepper is sold wholesale for about 1*s.* 4*d.* per pound, it is apparent that the admixture with it of a foreign substance costing only 1*d.* per pound must represent a substantial profit to those who use it. It would probably not be an exaggeration to say that a pepper grinder in a considerable way of business introducing fifteen per cent. of the *poivre* into his manufacture would net 6,000*l.* a year by the adulteration. It is not alleged that the foreign ingredient is deleterious to health, but ground olive stone is not pepper, and the person who buys and pays for pepper at the price of the genuine article is defrauded by the sophistication. It is on this ground that the prosecutions have been instituted, and they have not been without practical effect. It is now announced that the manufacture of *poivre* at Leghorn has been discontinued, and that its importation into England has ceased. It is not a little suggestive, however, that it has just made its appearance in America, and that there is an evident desire to open the illegitimate trade on that side of the Atlantic.

HOW OLIVE OIL IS CLARIFIED.

The first pressing of the olives, as we have seen, alone yields the finest oil. But this oil in its natural state, as it passes from the grower's to the merchant's hands, contains in suspension a variable quantity of minute particles of the fruit as well as some little water. In this state it is cloudy and turbid, neither pleasing to the eye nor in fit condition for keeping. New oil must therefore be filtered, which is done by passing it several times through layers of carded cotton wool in a suitably arranged apparatus. The raw cotton must be absolutely free from any odor and the oil uncongealed. During winter, the season when most olive oil is produced, it is necessary to warm it gently,

which is best effected in a pan with a double bottom, or jacket, through which steam circulates. Contact with fire is thus avoided, and there is no danger of overheating or cooking the oil, which would spoil it.

When perfectly bright and limpid, it is pumped into covered tanks for storage; the best kind being of solid masonry lined with hard marble or glazed tiles; these are made to hold as much as fifteen thousand gallons each. In such tanks the oil remains at an equable temperature, and during the hottest weather is kept cool, which is an important consideration.

AN ERRONEOUS IDEA.

An erroneous idea is prevalent that fine olive oil is the result of some refining process which renders it fit for consumption; just as if common olive oil in the hands of a skillful "refiner" would develop into a choice quality. This is an absurdity. Fine oil is the product obtained by pressing sound olives in a rational manner, as described. Its quality is fixed, for good or bad, when it leaves the oil press; it cannot be improved by any "refining"; but, of course, if not properly filtered and stored, it may deteriorate. An eminent authority, Professor Cuppari, of the University of Pisa, in his "Lessons on Agriculture," thus expresses this fact: "Olive oil is not like the juice of the grape, which requires a chemical process to transform the sugar it contains into alcohol in order that it may become wine; the oil is there, ready made within the fruit, and the utmost that can be done is to extract it, just as it is, bursting the cells within which it is inclosed by crushing the olives and then pressing them."



RAZZO OLIVE.

SUMMING UP.

To sum up, therefore, the finest olive oil is obtained only from the first pressing of the olives ; but there are many other conditions to be fulfilled, failing any one of which the oil produced cannot attain to the finest quality. The fruit must be ripe and sound. It must be equally free from injury by frost or maggot. It must be freshly gathered and promptly pressed, before any fermentation can set in ; the water used during the process must be absolutely pure. The mills, presses, and utensils must be clean and sweet. The olives must be of the best kinds.

It is therefore apparent that to unite all these conditions is no easy matter, considering also that few crops are liable to such injury from weather and insects as the olive, which, moreover, is gathered chiefly during winter-time, the most unfavorable season of the year. Hence it is that so large a part of the olive oil produced in the world is of very inferior quality.

INFLUENCE OF SOIL.

But beyond and above all these conditions, the influence of soil and climate in the production of the finest qualities of olive oil must be taken into account. It is to this cause that are largely due the great differences in quality existing between olive oils produced in different localities. On this subject we take the following from the official "Report upon the Conditions of Agriculture in Italy," drawn up by the Italian Ministry of Agriculture, Industry, and Commerce, a work in three quarto volumes, embracing

*Ministero di Agricoltura, Industria e Commercio (Divisione di Agricoltura).—"Relazione

ing all the chief agricultural industries of Italy, to which we are indebted for much valuable information.

"There is hardly a doubt that the soil, according to its different composition, has an extraordinary influence on the quality of the products it yields, whatever they may be ; and this influence, it appears, is more marked in the case of the olive-tree than in that of any other agricultural product. It is a known fact that the best oils are grown on a schistous formation where lime abounds ; and that, on the contrary, oil grown on clayey soils, or where the soil is too poor, never attains to a high degree of perfection however great be the attention paid. The different exposure and elevation of localities, moreover, and even the degree of intensity of light, may to a certain extent contribute to render oil more or less good."*

Too warm a climate, the Report goes on to say, is not favorable to developing delicacy in olive oil, but rather a temperate climate ; hence it is that oils produced in the Levant and the far south of Europe are not as good as the oils produced in Italy, and that amongst the latter those of Tuscany, Umbria, and the Riviera are of much greater merit than those of Sicily, and, generally speaking, of the Neapolitan Provinces, *i. e.*, the southern section of Italy.

The influence of climate and soil on the quality of olive oil, in our opinion, which is confirmed by the foregoing extract, cannot be exaggerated. To any one at all versed in the article, the difference between Tuscan olive oil and that produced in the districts of Bari, Umbria, or Riviera is most marked. It is impossible to mistake one for the other. *Intorno alle Condizioni dell' Agricoltura.*" Vol. I., page 587.

other; and while other considerations partially account for these differences, they are chiefly due to the influence of the soil. Thus, it has been observed on the same estate that oil produced from trees growing on a clayey soil is very much inferior to that obtained from trees growing on a different formation on the opposite side of the same hill.

SELECTION OF FINE OILS.

While in Tuscany there are districts famed for their olive oil, it is not to be supposed that all the oil produced therein is of equal merit or excellence. Qualities vary even in the same locality, and hence the need for a careful selection in order to arrive at the highest possible standard of excellence.

An olive farm famed for its produce may one year make oil of splendid quality; the next year the reverse may be the case. The olive-fly is very capricious in its ravages, and the warmer exposure of an olive plantation may lead to all the fruit being ruined by this fly, while not a mile away another plantation in a less sheltered situation may escape such damage.

The same is the case with regard to frost; severe, damp cold may injure the fruit in a low-lying locality, while close by, but higher up, the fruit may be uninjured.

Hence, in selecting the finest qualities of olive oil it is not by any means sufficient to know in what locality the oil has been grown. The ultimate test of quality is the palate, and to be a good taster of olive oil requires a nice, discriminating palate and long practice. Of course if olive oil is of dark color, or possesses the least bad odor, it is condemned at once. But even when free from objec-

tion on both points, the palate may reveal some fatal defect, due either to the condition of the fruit or the process of expressing the oil; or else the oil may simply be made from an inferior class of olives, and therefore of a second rate quality. Olive oil is tasted by itself, pure and simple.

According to Professor Bain, an authority on the subject, it has been ascertained that while the tip of the tongue discriminates between pungent tastes, such as pepper and mustard, and the central part as to sweets and bitters, the seat of those peculiar tastes, to which the professor has given the names of *relishes*, and *disgusts*, is the back part of the tongue and throat. It is here chiefly that fats, butters, and oils can be properly tasted.

If olive oil of very inferior quality, tainted and rancid, continues to be largely sold in America as being the very best, and paid for proportionately, this can only be because consumers do not taste it in the proper way, by itself, before using it. There is no great difficulty in determining whether olive oil is pleasant to the taste, or the reverse. But if in a salad-dressing it be overpowered by fiery condiments, bad olive oil often may escape detection.

HOW LONG FINE OIL KEEPS GOOD.

Fine olive oil is not improved by age, like wine. But while inferior qualities become infinitely worse by keeping, the best Tuscan oil, properly kept, will retain its sweetness and freshness for fully two years from the time it was made. Here it may be remarked that fine oil undoubtedly retains its good qualities longer when it is exported in bottles, than in tin cans or in casks.

Glass can communicate no bad taste to it, but tin and wood are both liable to do so, in course of time.

SEDIMENT IN BOTTLES.

Occasionally, *new* olive oil, when bottled early in the season, although most carefully filtered, will deposit a little sediment in bottles. The sediment merely consists of very minute particles of the fruit; though not pleasing to the eye, it ought to be generally known that this sediment has no importance whatever, and proves absolutely nothing against either the purity or the excellence of the oil in question.

EFFECTS OF COLD.

Fine olive oil under the influence of cold loses its brightness and turns cloudy; often, though it continues to be fluid, flakes are to be seen floating about, the appearance of which in bottled oil has sometimes given rise to unfounded suspicions. The effect of a low temperature is to separate, temporarily, some of the constituent parts of olive oil; hence the flakes. But this natural phenomenon is of no moment whatever; on warming the contents of a bottle in which these flakes are visible, it will be remarked that they disappear and that the oil resumes its brightness.

ADULTERATION.

Great scope for adulteration is offered in the number of cheap vegetable oils which can be profitably employed for the purpose, such as cotton-seed, ground-nut, sesame, and colza oils. Of these, cotton-seed and ground-nut oils are probably more generally used, and

in Italy, cotton-seed oil. To check the practice, a customs duty of 14 lire per 100 kilograms was imposed in Italy on this oil.

Adulteration is not by any means confined to Italy. Seed oils of various kinds are largely imported as well as made in France. There are factories at Marseilles and Bordeaux where oil is extracted from African ground-nuts, *arachides*, of which there is an enormous importation. Not only is this oil used to adulterate olive oil, but it is said to be used, to some extent, as a substitute for it, in packing cheap brands of sardines.

In the United States it is a fact that olive oil, imported in casks, is there mixed with cotton-seed oil and retailed as pure olive.

Adulteration of butter has been already dealt with by Congress, and in course of time it is hoped that everywhere the adulteration of articles of food will be put down. Even in Turkey action has been taken, as the following extract shows:

ADULTERATED OLIVE OIL.—The Secretary of State has received a dispatch from Mr. Pendleton King, *chargé d'affaires ad interim* of this government at Constantinople, of December 14, 1886, saying that the Sublime Porte had decided, on the recommendation of the Council of State, in order to prevent the sale of adulterated olive oil, which is sold to the detriment of the public health, to have that commodity examined by inspectors appointed from the Imperial Faculty of Medicine, and by municipal agents, and to confiscate the oils which are mixed with cotton oil or with any other pernicious substance.

One fact, however, which must be especially noted, is that adulteration is confined to *low* qualities of olive oil.

It will not pay to adulterate fine olive oil, for the quality would be irretrievably ruined, and it would then sell only



OLIVE FARM NEAR MONTEMAGNO.

at the price of common oil. Olive oil of really fine quality is so delicate that the addition of as little as one per cent. of its volume of cotton-seed, or other such oil, a quantity far too small to pay, can be easily detected by the taste. Such oil is ruined, degraded in fact, and acquires the unmistakable twang of cotton-seed oil. However highly refined the latter may be, it is rank and nauseous compared with good olive oil.

Common olive oil, which is more or less fetid, can hardly be made much worse, so far as the taste is concerned, by being adulterated; and this is the kind of oil which is adulterated. It is necessary to add that in Tuscany, as generally throughout Italy, olive oil growers never attempt any adulteration of their produce, but rather are anxious that the practice should be put down by law, as contrary to their interests; and such it undoubtedly is.

As to the export trade in fine olive oil, it is certain that the brand of a firm of long standing and high repute affords the best guarantee of purity and genuineness. Hence, the difficulty sometimes alleged of obtaining Tuscan olive oil of equal purity and excellence is exaggerated.

WHERE IS THE FINEST OLIVE OIL GROWN?

In Italy the finer qualities of olive oil are produced in the districts of Bari, on the south-east shore of the Adriatic, Umbria in central Italy, Tuscany, and Liguria, the latter including the districts of Genoa and Porto Maurizio—the Riviera, it is generally called.

The chief olive oil producing districts

of France are Nice and Provence (Alpes-Maritimes, Bouches-du-Rhône, and Var; the produce of Provence being frequently called Aix oil.

A French writer thus alludes in jest to Aix oil: “Quant à l’huile d’Aix, c’est une plaisanterie inventée contre les Aixois: pendant que je faisais mon cours de droit à Aix, je n’y ai vu que quelques oliviers, gros comme des chous de Bruxelles.” *

Nice oil resembles in character the produce of the adjacent district of the Riviera, Italy, sometimes called the Genoa district, and is superior to the oil of Provence or Aix. The reason is not far to seek. Most of the olives in Provence, owing to the special conditions of the locality, are of an inferior class; chiefly of the *Moraiolo* variety, which, as we had occasion to explain in treating of the different varieties of the olive-tree, most approximates to the wild olive.

Provence oil has been much bepraised by interested persons; but any reputation it may have acquired in places where little is known on the subject of fine olive oil is purely fictitious and destitute of real foundation.

No olive oil produced elsewhere in Italy, or in any part of France, can compare with the best Tuscan oil which it is the privilege of the neighboring provinces of Lucca and Pisa to produce. The other sections of Tuscany, namely, Florence, Siena, and Grosseto, produce good qualities, but not equal to the oils of Lucca and Pisa.

In these favored districts the hills, up to a certain altitude, and where the situation is favorable, are clothed with fine

* Émile Négrin. “Guide de Nice,” 1874.

“As to the oil of Aix, it is a joke invented against the inhabitants of Aix: when

I was attending a course of law at Aix, I saw there only a few olive-trees as big as Brussels sprouts.”

olive-trees of the best kinds, the *Razzo* olive largely prevailing. There is an ample supply of pure spring water, and, moreover, the greatest attention is devoted to the culture of the trees and to the process of oil-making. But there can be no question that the special excellence of the oils grown here is largely due to the influence of the soil.

The produce of these two districts (which is generally called *Lucca Oil*, though in this matter Pisa is fully on a par with the sister province), when of the best quality, is distinguished by its fine golden color and delicate taste. It is absolutely free from any tainted smell or tendency to rancidness, and will retain its freshness and sweetness longer than any other growth of olive oil.

The respective merits of different growths of olive oil is a subject of controversy amongst rival growers and exporters; still, it is hardly to be wondered at if each district claims the superiority for its own produce.

As regards the oils exported from France, in the main, they are not of French, but of Italian origin. France imports some five or six million gallons a year of Italian olive oil; her own production is small and quite inadequate to supply the home market. Moreover, to those who are connoisseurs of the article and acquainted with the various growths of Italy, the fact is patent that the greater part of such so-called French oil is simply Bari and Riviera oil. It is at least a curious coincidence that much of the olive oil in bottles exported to the United States from France is simply called "olive oil" on the labels, without anything being specified as to its origin.

The chief demand in France is for the oils of the districts of Bari and the

Riviera (Genoa), which are very much cheaper than those of Tuscany and just as much inferior. But it is a suggestive fact, which admits of proof, that buyers from Aix in Provence, France, actually come to Tuscany every year to make their purchases of fine Tuscan oil. These buyers are well aware that neither in their own district, the department of Var, nor in any other section of France, is there any olive oil produced which will compare with good Tuscan oil.

We have seen it stated in the circulars and announcements of those engaged in the trade, that the olive oil exported from Bordeaux is produced either in Provence or the districts of Nice and Genoa; and that these are the finest oils in the world; as for Tuscan oils, they are nowhere in comparison.

The same statements are repeated in a recent Report from the United States Consulate at Bordeaux, on "Bordeaux Olive Oil." It says: "Most of the olive oils exported from this consular district come from the department of Var, in south-eastern France, and the country surrounding Genoa, Italy, and are respectively known as the 'huile d'Aix' and 'huile de Nice.' Large quantities of olive oil are produced in Tuscany, but, owing to the quality, find little demand on this market."

As to the latter statement, it may be remarked that buyers in America, or other countries, when they want Tuscan olive oil, go to the fountain-head for it, to Leghorn, the seaport of Tuscany, whence all its products are exported direct, and not to Bordeaux. But it is sufficiently curious that Genoa oil should actually be conveyed to Bordeaux, only to be re-exported thence,

charged with unnecessary extra freightage and several intermediate profits.

It is interesting and instructive, however, to note that the oil of the district of Genoa, and that produced in France, are considered at Bordeaux of equal merit. The circumstance before referred to, that much of the olive oil exported from Bordeaux, and of the most reputed brands, bears no indication on the labels of the bottles as to *where* it was grown, confirms this view; for, obviously, the contents may be, indifferently, Genoa oil or French oil.

This being so, we shall show on unquestionable authority that Genoa oil (and therefore Nice and Provence oil, also) is *inferior* to the best Tuscan oil. And such an authority we conceive to be the official "Report upon the Conditions of Agriculture" in Italy, drawn up by the Ministry of Agriculture, Industry, and Commerce (Bureau of Agriculture), from which we have before quoted. Seeing that both the oil of the district of Genoa and of Tuscany are *Italian* products, it would hardly be possible to quote a higher, a more unbiased, or disinterested authority as to

their comparative merits than the ITALIAN STATE DEPARTMENT OF AGRICULTURE. Against this the unsupported assertions of Bordeaux exporters will not carry much weight.

This official publication states that: "*The oils most celebrated for their excellence are those of CALCI and BUTI on the Pisa hills, and those of LUCCA (viz., the most noted districts of TUSCANY), which justly enjoy the very highest repute in foreign countries*; next to these come, generally speaking, the oils of nearly the whole of Tuscany, of Bari, the environs of Lake Thrasimene (Umbria), and of some parts of Liguria (Genoa district)." And again in another passage: "THE TUSCAN OILS OF LUCCA, CALCI, AND BUTI ARE ESTEEMED THE FINEST IN THE WORLD."*

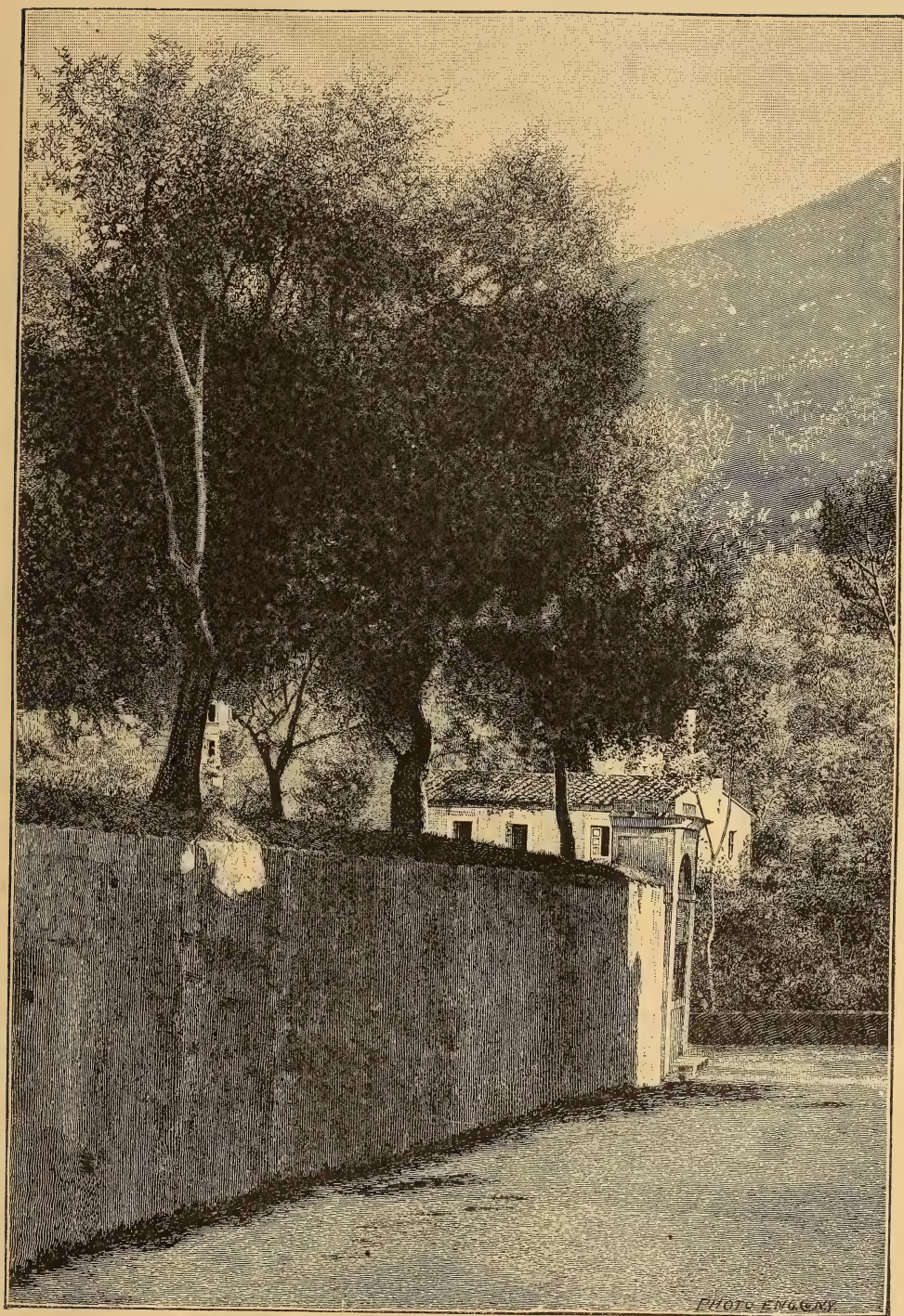
This disposes of the question.

We need only add that if consumers make sure that they are really getting the best LUCCA OIL, they will soon satisfy themselves that it is, without exception, THE FINEST OLIVE OIL IN THE WORLD.

* Ministero di Agricoltura, Industria e Commercio (Divisione di Agricoltura).—"Relazione intorno alle Condizioni dell' Agricoltura." Vol. I., page 409: "Gli olii più celebrati per la loro finezza sono quelli di Calci e di Buti nelle colline pisane e quelli di Lucca, che giusta-

mente godono di grandissima fama all'estero. A questi poi si accostano in generale gli olii di quasi tutta la Toscana, del Barese, dei contorni del Lago Trasimeno e di alcune parti della Liguria." Ib. p. 587: "Gli olii Toscani di Lucca, di Calci e di Buti, sono stimati i primi olii del mondo."





REZZANO, NEAR CALCI.



THE following extract is taken from a report, by the Secretary of Her Majesty's embassy at Rome, on the Wine and Olive Oil Industries of Italy, which appeared in the official "Board of Trade Journal," February, 1887 :

The finest olive oil, not only in Italy but in the world, is produced in certain hilly districts of Tuscany, such as Lucca, Calci, and Buti. There the olive-trees are of the best stock and carefully tended ; great care is also devoted to harvesting the olives and to crushing and pressing them. The oil so obtained, pure and unsophisticated, which I had the opportunity of tasting during a recent visit to Tuscany, is most delicate and delicious. But in these days of excessive competition, when quality is often sacrificed to cheapness, it is not always an easy matter to procure the best quality of Tuscan, or Lucca, oil,

as it is generally called out of Tuscany. Still it is to be had, and I may mention that large quantities are exported to England and the United States.

"The purity of the oil has been recognized at my table, even by Italians in Rome." (*The Lucca oil here referred to was supplied by S. Rae & Co.*)

HER MAJESTY'S CONSUL AT LEGHORN, ITALY, in his reports on trade to the Secretary of State for Foreign Affairs, London, England, states that S. RAE & Co. have supplied their Lucca Olive Oil to the chief importers in London for the last forty years, and adds : "*It may be satisfactory to the public to know the source of the VERY BEST EATING OIL AND THE HIGH CHARACTER it undoubtedly enjoys in the place of its production.*"

(See "Reports from Her Majesty's Consuls," No. 6, 1885, Part III.)



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OF THE FINEST QUALITY PRODUCED

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FINEST SUBLIME

LUCCA OIL

IS A SELECTION FROM
THE BEST GROWTHS OF THE LUCCA AND PISA DISTRICTS (TUSCANY),
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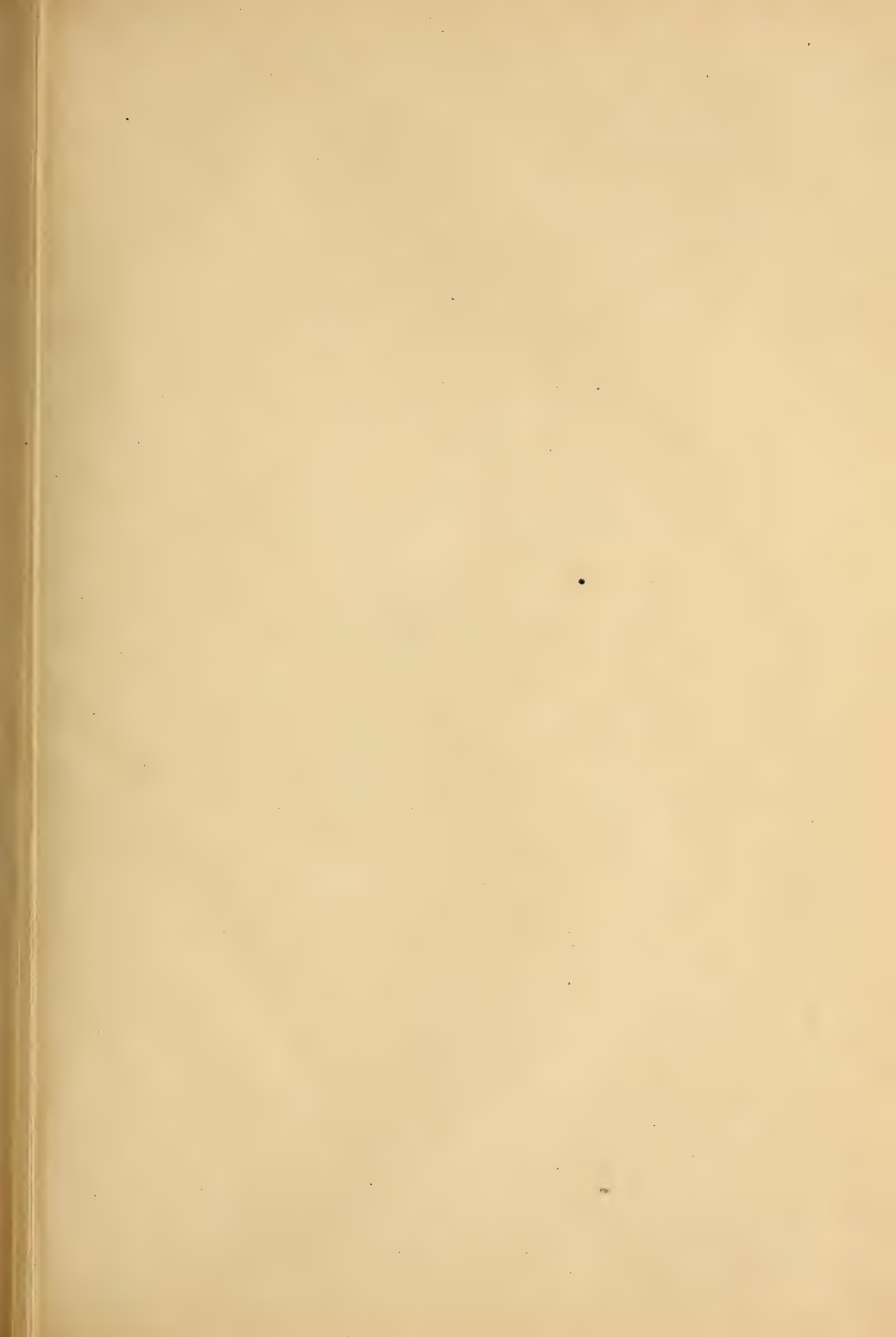
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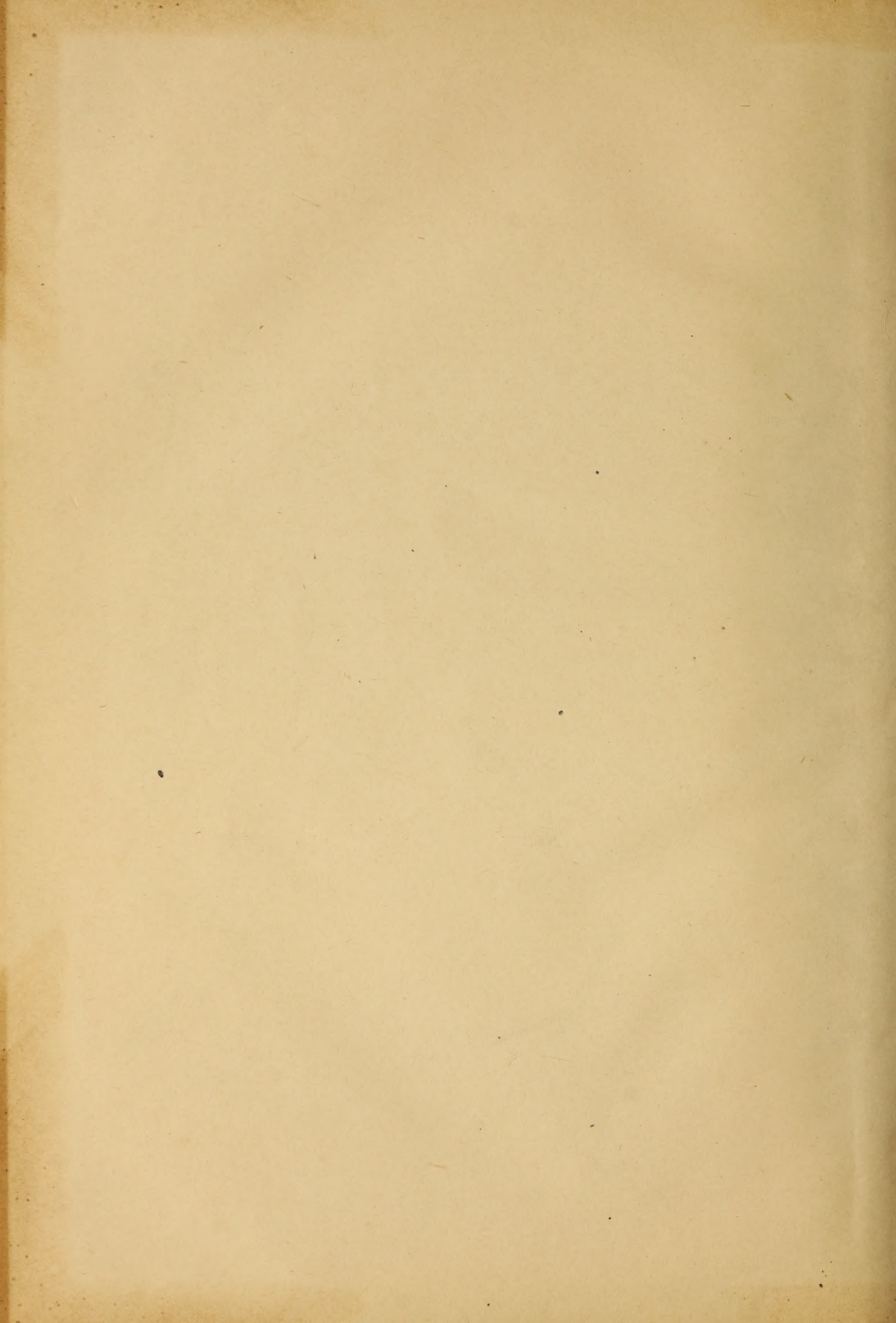
RAE'S OIL can be had from any first-class grocer. If your grocer does not handle it, please send us a postal card, and we will send to a retail grocer, who will deliver same to your residence



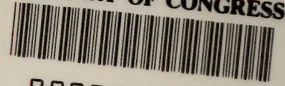
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